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30.(amended) The process described in claim 26 wherein the step of subjecting said fresh surface to a rinse further comprises emitting said solution that comprises isopropyl alcohol from a dispenser at a flow rate between about 100 and 300 ml/min.

REMARKS

Examiner Estrada is thanked for her thorough search and Office Action. Reconsideration of the rejection of all claims is respectfully requested. We wish to comment on her remarks as follows:

Reconsideration is requested of all rejections based on 35 U.S.C. 112:

The phrase "high pressure rinse" has now been replaced by --rinse-- wherever it appears in the claims.

Reconsideration is requested of all rejections based on 35 U.S.C. 103:

US Patent 2003/0073286 A1 is believed to have been used by the Examiner as prior

art to the subject application under 35 USC 102(e).

US Patent 2003/0073286 A1 is removed as a reference under 35 USC 103{c} because 6the referenced patent, and the claimed invention, were, at the time the invention was made, owned by the same person. Please see the following 103{c} statement:

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35 USC 103 {c} statement

Application 10/042,573 and US Patent 2003/0073286 A1 were, at the time the invention of Application 10/042,573 was made, commonly owned by Taiwan Semiconductor Manufacturing Company, Hsinchu, Taiwan.

With the removal of US 2003/0073286 A1 as a reference under 102(e), the above rejection is now considered moot. Reconsideration of the rejection is therefore respectfully requested.

In conclusion, we again thank Examiner Estrada for her careful reading of our application.

Reconsideration and withdrawal of the rejection is respectfully requested.

Allowance of all Claims is requested.

It is also requested that should Examiner Estrada not find that the Claims are now Allowable, she should please call the undersigned Attorney at (845)-452-5863 to overcome any problems preventing Allowance.

Respectfully submitted

Stephen B. Ackerman #37761

VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the claims:

Please amend the following claims:

1. A process for removing a layer of silicon oxynitride, comprising:

providing a substrate and depositing thereon a layer of silicon oxynitride;

mounting said substrate on a platen and, using a polishing pad and a slurry, removing said layer of silicon oxynitride, thereby forming a fresh surface;

removing said polishing pad and then washing off any remaining slurry; and

with said substrate still on the platen, subjecting said fresh surface to a [high pressure] rinse by a solution that comprises a surfactant that modifies hydrophobic behavior, thereby removing from said fresh surface any and all residual particles of silicon oxynitride.

4. The process described in claim 1 wherein said fresh surface is subjected to said [high pressure] rinse for between about 5 and 20 seconds.

5. A process for removing a layer of silicon oxynitride, comprising:

providing a substrate and depositing thereon a layer of silicon oxynitride;

mounting said substrate on a platen and, using a polishing pad and a slurry, removing said layer of silicon oxynitride, thereby forming a fresh surface;

removing said polishing pad and then washing off any remaining slurry; and

with said substrate still on the platen, subjecting said fresh surface to a [high pressure] rinse by a solution that comprises tetramethyl ammonium hydroxide, thereby removing from said fresh surface any and all residual particles of silicon oxynitride.

8. The process described in claim 5 wherein said fresh surface is subjected to said [high pressure] rinse for between about 5 and 20 seconds.

9. A process for removing a layer of silicon oxynitride, comprising:

providing a substrate and depositing thereon a layer of silicon oxynitride;

mounting said substrate on a platen and, using a polishing pad and a slurry, removing said layer of silicon oxynitride, thereby forming a fresh surface;

removing said polishing pad and then washing off any remaining slurry; and

with said substrate still on the platen, subjecting said fresh surface to a [high pressure] rinse by a solution that comprises isopropyl alcohol, thereby removing from said fresh surface any and all residual particles of silicon oxynitride.

12. The process described in claim 9 wherein said fresh surface is subjected to said [high pressure] rinse for between about 5 and 20 seconds.

13. A process for forming a tungsten stud in a silicon integrated circuit, comprising:

providing a partially completed integrated circuit whose top layer is conductive;

on said conductive layer, depositing a dielectric layer;

on said dielectric layer, depositing a layer of silicon oxynitride;

on said layer of silicon oxynitride, depositing a layer of titanium nitride;

patterning and then etching said titanium nitride, silicon oxynitride, and dielectric layers to form a via hole that extends as far as said conductive layer;

over-filling said via hole with tungsten whereby a layer of tungsten, having a first thickness, covers said titanium nitride layer;

on a first platen, subjecting said tungsten layer to CMP until a second thickness of tungsten covers said titanium nitride layer;

on a second platen, subjecting said integrated circuit to CMP until all tungsten outside said via hole has been removed and until said layer of titanium nitride has also been removed;

on a third platen, subjecting said integrated circuit to CMP, using a polishing pad and a slurry, until said layer of silicon oxynitride has been removed, thereby forming a fresh surface;

removing said polishing pad and then washing off any remaining slurry; and

with said integrated circuit still on said third platen, subjecting said fresh surface to a [high pressure] rinse by a solution that comprises a surfactant that modifies hydrophobic behavior, thereby removing from said fresh surface any and all residual particles of silicon

oxynitride.

16. The process described in claim 13 wherein said fresh surface is subjected to said [high pressure] rinse for between about 5 and 20 seconds.

17. The process described in claim 13 wherein the step of subjecting said fresh surface to a [high pressure] rinse further comprises emitting said solution that comprises a surfactant from a dispenser at a flow rate between about 100 and 300 ml/min.

19. A process for forming a tungsten stud in a silicon integrated circuit, comprising:

providing a partially completed integrated circuit whose top layer is conductive;

on said conductive layer, depositing a dielectric layer;

on said dielectric layer, depositing a layer of silicon oxynitride;

on said layer of silicon oxynitride, depositing a layer of titanium nitride;

patterning and then etching said titanium nitride, silicon oxynitride, and dielectric layers to form a via hole that extends as far as said conductive layer;

over-filling said via hole with tungsten whereby a layer of tungsten, having a first thickness, covers said titanium nitride layer;

on a first platen, subjecting said tungsten layer to CMP until a second thickness of tungsten covers said titanium nitride layer;

on a second platen, subjecting said integrated circuit to CMP until all tungsten outside said via hole has been removed and until said layer of titanium nitride has also been removed;

on a third platen, subjecting said integrated circuit to CMP, using a polishing pad and a slurry, until said layer of silicon oxynitride has been removed, thereby forming a fresh surface;

removing said polishing pad and then washing off any remaining slurry; and

with said integrated circuit still on said third platen, subjecting said fresh surface to a [high pressure] rinse by a solution that comprises tetramethyl ammonium hydroxide, thereby removing from said fresh surface any and all residual particles of silicon oxynitride.

22. The process described in claim 19 wherein said fresh surface is subjected to said [high pressure] rinse for between about 5 and 20 seconds.

23. The process described in claim 19 wherein the step of subjecting said fresh surface to a [high pressure] rinse further comprises emitting said solution that comprises tetramethyl ammonium hydroxide from a dispenser at a flow rate between about 100 and 300 ml/min.

26. A process for forming a tungsten stud in a silicon integrated circuit, comprising:

providing a partially completed integrated circuit whose top layer is conductive;

on said conductive layer, depositing a dielectric layer;

on said dielectric layer, depositing a layer of silicon oxynitride;

on said layer of silicon oxynitride, depositing a layer of titanium nitride;

patterning and then etching said titanium nitride, silicon oxynitride, and dielectric layers to form a via hole that extends as far as said conductive layer;

over-filling said via hole with tungsten whereby a layer of tungsten, having a first thickness, covers said titanium nitride layer;

on a first platen, subjecting said tungsten layer to CMP until a second thickness of tungsten covers said titanium nitride layer;

on a second platen, subjecting said integrated circuit to CMP until all tungsten outside said via hole has been removed and until said layer of titanium nitride has also been removed;

on a third platen, subjecting said integrated circuit to CMP, using a polishing pad and a slurry, until said layer of silicon oxynitride has been removed, thereby forming a fresh surface;

removing said polishing pad and then washing off any remaining slurry; and

with said integrated circuit still on said third platen, subjecting said fresh surface to a [high pressure] rinse by a solution that comprises isopropyl alcohol, thereby removing from said fresh surface any and all residual particles of silicon oxynitride.

29. The process described in claim 26 wherein said fresh surface is subjected to said [high pressure] rinse for between about 5 and 20 seconds.

30. The process described in claim 26 wherein the step of subjecting said fresh surface to a [high pressure] rinse further comprises emitting said solution that comprises isopropyl alcohol from a dispenser at a flow rate between about 100 and 300 ml/min.